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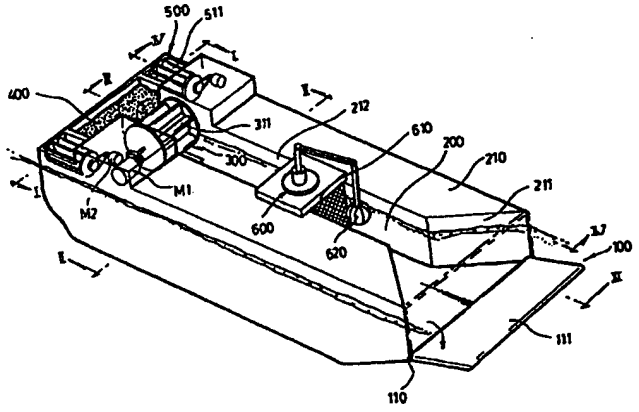

(57) Abstract

The ship for removing the floated matter comprises a floated matter inflow unit (100) being installed at front end of ship for receiving the floated matters (e.g., oil and trash) floated on the sea; a floated matter guiding passage (200) formed by buoyancy means (210) located at both sides of the ship and a first tank (240) formed at a lower portion of the ship, the floated matter guiding passage (200) guiding the floated matters flowed through the floated matter inflow unit (100); a trash removing device (600) for removing the trash contained in the floater matter, the trash removing device (600) comprising a plate (241) installed at constant depth in the first tank (240) having a plurality of holes (242) for dispersing the water to the lower portion of the ship, a filtering net (610) installed upward on the plate (241) for blocking the trash of the floated matter, and a lift means (620) for lifting the trash blocked by the filtering net (610); and an oil separating unit (300) for separating and collecting oil floated on the water along the floated matter guiding passage (200), the oil separating unit (300) being located at rear portion of said floated matter guiding passage (200); water discharging means (500) installed at both sides of the ship stern and separated from an oil tank (400) and the oil separating means (300), respectively, the water discharging means (500) receiving water dispersed through the first tank (240) and discharging the water outside of the ship.

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SHIP FOR REMOVING FLOATED MATTER

BACKGROUND OF THE INVENTION

TECHNICAL FIELD

The present invention relates to a ship for removing floated matter and, more particularly, to a ship for removing floated matter comprising three spaces consisted of a central space for separating an oil from a water and both side spaces for discharging the water, and a trash collecting device for separating and collecting a trash when the water containing the floated matter is flowed therein

BACKGROUND ART

Recently, marine accidents caused by large-sized ships(particularly oil tankers) on the sea cause an outflow of a large quantity of oil and trash(that is, floated matter) on the sea, which makes a sea environmental disruption and seriously loss of the property since a sea farming such as seaweeds, or fishes and shellfish etc., or the coast are covered with the oil spilled from the ship.

Although, chemicals, etc. has been used for removing the spilled oil, the spilled oil is only emulsified or sunk into the sea by the chemical so that the spilled oil is only removed visually.

To settle such disadvantages, the Korean Utility Model

Publication No.82-1602 was proposed. In an oil collecting apparatus of a skimmer ship of this proposal, a spiral rotator whose cross section has a spirally wound shape is movably installed in a frame. A driving device is connected to this spirally wounded rotator for rotating the spirally wounded rotator in its main direction under a state in which an opening part thereof is directed to the fore side. Simultaneously, a rotating blades which rotates a lower connection part sunk into the water in response to a rotation of the spirally wound rotator is geared with an annular rack mounted to a frame by the driving gear at a horizontal position of the spirally wound rotator.

In such apparatus, however, prior to a use of the spirally wound rotator, a work for separating oil from a drum by using a scrubbing roller should be performed, wherein the taking-away roller has a function for eliminating the oil smeared on a brush through a use of a drum on which a plural number of brushes are installed. However, the drum can not be revolved fast due to the viscosity of the oil. Further, there is no means for treating the water adhered to oil, thus, the amount of collected oil and water is increased so that the actual amount of oil received in the storage tank is not so much. As a result, a large storage tank is required.

In order to solve the above-mentioned problems, a proposal comprising a hull having a number of separated tanks, an oil inflow unit for receiving a spilled oil into the hull, an oil drawing means for drawing the inflow oil, an oil separating/

extracting means for separating and extracting the oil from the water and an adjusting means for adjusting the height of the oil drawing means and the oil separating/extracting means is disclosed in the Korean Patent No. 161609. This proposal will be described referring to FIGs. 1 and 4, as follows.

As shown in the drawings, a hull **A** has a plurality of tank **1** divided by a bulkhead **2**, and opening and shutting blades **3**, **3a** which acts an oil inflow unit **B**, are installed in a folded shape in a front end of the hull. As this installing unit, a rod **4** of a cylinder is fixed to the opening and shutting blades **3**, **3a**, and the cylinder main body **4a** is fixed to one side of the hull **A** made up of the tanks. Also, an oil inflow part **5** provided as a hull bottom is formed in a front inside of the hull **A**.

In the rear side of the oil inflow part **5**, an oil drawing means **C** for drawing the flowed-in oil and an oil separating /extracting means **D** for separating and extracting the oil form the water and an adjusting means **E** for adjusting the height of the oil separating /extracting means **D**.

Description of construction of the oil drawing unit **C** will be described in detail. A supporting prop **6** is installed on both sides of the tank for use of the oil separation and removal consisted of the oil separating/extracting means **D**, and a hydraulic turbine frame **9** having a plurality of hydraulic blades **8** is rotatably mounted to the supporting prop **6** by a shaft **7** so as to be rotated by a driving force. This hydraulic frame **9** has side plates **10**, **10a** which support and fix the hydraulic turbine

blades **8** at both sides thereof. The shaft **7** is installed in axle by supporting bearings **11**, **11a**, a sprocket **12** is also set in axle to the shaft **7**, and the sprocket **12** is connected to a driving motor **14** having a driving sprocket **13** by a chain **15**.

Detailed description of the oil separating/extracting means **D** are as follows. An oil separating and storage tank **16** is installed under the hydraulic turbine frame **9**, and one side surface of the oil separating and storage tank **16** is formed as a rounding face **17** which has an arc shape such as a circumferential part of the hydraulic turbine blade **8** of the hydraulic turbine frame **9**. A gap between the rounding face **17** and an external end of the hydraulic turbine blade **8** is made. An inflow aperture **19** is formed at upper side of the oil separating and storage tank **16** for inflow the draw oil mixed with water to a mixing tub **18**. A partition **20** is provided downward a side of the inflow aperture **19** so that a circular stream part **21** is formed at lower portion and a discharging passage **22** is formed at a side portion. A water surface reference plate **23** is projected to an upper side of the discharging passage **22**, and a draining passage **25** connected to a draining aperture **24** is installed at side of water the surface reference plate **23**. This draining passage **25** is extended outside of the both sides of the hull **A** as shown in FIG. 3.

An oil extracting part **26** is formed at an upper portion of the mixing tub **18**, and an oil removing inflow pipe **27** is installed at lower side of the oil extracting part **26** and a lower portion of the oil removing inflow pipe **27** is formed in U-shape

and connected to an oil discharging pipe **28**. An additional water discharging pipe **29** is connected to a lower portion of the U-shaped oil removing inflow pipe **27**. An oil inflow pipe **30** for controlling a height is combined with an upper portion of the oil removing inflow pipe **27** by a screw combination to control the height. Opening and shutting valves **31**, **31a** are provided at the oil discharging pipe **28** and the water discharging pipe **29**, respectively.

For the adjusting mean **E** for adjusting the height of the oil drawing means **C** and the oil separating/extracting means **D**, a cylinder **32** is installed at an upper side of a rear outer surface of the oil separating and storage tank **16**. The rod **33** of the cylinder is fixed to an outer side wall of the oil separating and storage tank **16**, and a cylinder body **34** is fixed to an external side wall of any one tank of the hull **A**, and a hinge part **35** is installed on a bottom surface of the hull.

An operating room **36** is provided in the rear portion of the hull **A**, and an engine room is provided in both sides of rear portion of the hull. Engines **37**, **37a** are provided for rotating propellers **39**, **39a**. Each of the tanks **1** of the hull **A** has an aperture **40** so that the oil discharging pipe **28** is inserted into aperture **40**. Therefore, the collected oil is discharged into the inside of the tank **1**. A character **P** shown in FIGs. 2 and 3 indicates the water surface of the sea.

In the ship having the above-mentioned constructions, the opening and shutting blades **3**, **3a** are expanded by the cylinder

4a and the rod 4, when oil outflown on the sea from a ship such as an oil carrier, etc., The ship also moves towards an oil floating position, thus the spilled oil is flowed into the oil inflow part 5. At this time, the oil mixed with water flows in on the bottom of the oil inflow part 5. Then, the hydraulic turbine frame 9 which is the oil drawing means C is rotated to draw the oil mixed with the water and having a high consistency. Next, the oil is drawn through the inflow aperture 19 of the oil separating/extracting means D and then the pure oil whose consistency is much high, is extracted.

That is, the driving motor 14 is driven to transfer the driving force through the driving sprocket 13, the chain 15 and the sprocket 12 installed in axle on the shaft 7, the hydraulic turbine frame 9 rotates about the shaft 7, therefore, the hydraulic turbine blade 8 also rotates along the rounding face 17 of the mixing tub 18 in direction of an arrow so that oil (mixture of the oil and water) located between the rounding face 17 and the hydraulic turbine blade 8 is drawn simultaneously. The drawn oil is floated on the water since the oil is lighter than water, the oil flows into the mixing tub 18 which is a part of the oil separating and storage tank 16 through the inflow aperture 19.

At this time, when the drawn oil flows in successively, the water located at a lower portion of the oil separating and storage tank 16 flows out over the water surface reference plate 23 through the circular stream part 21 and the discharging

passage **22**. The flowed-out water is discharged outside of the hull **A** along the draining passage **25** and the draining aperture **24**. The water surface is generated in the oil extracting part **26** by the water surface reference plate **23** of the oil separating and storage tank **16**, and the oil floated on this water flows into the oil inflow pipe **30** for controlling a height installed in the oil extracting part **26**. The flowed oil is sent to each tank **1** along the oil discharging pipe **28** through the oil removing inflow pipe **27**. In other words, the extracted oil is discharged to the tank **1** through the hole of the each tank **1** by the oil discharging pipe **28**. Also the oil flowed into the tank **1** is transferred to other oil carrier through a pipe not shown in the drawings. That is, the oil spilled on the sea is collected and stored in the other oil carrier. The water mixed with the oil sinks downwards according to the U-shape of the oil removing inflow pipe **27** in case that only oil flows in through the oil inflow pipe **30**. The sunk water is discharged outside of the hull **A** through the water discharging pipe **29**. That is, only the pure oil is collected and the water is discharged so that the polluted sea can be cleaned in a short time by a removal of only the oil.

However, such system has a good effect in a removal of oil but it has the problems that it is difficult to move to the polluted -oil area rapidly since the surface area of the ship is too large. Meanwhile, an apparatus comprising conveyer belt is provided for collecting a trash consisted of the floated matter on the water, the function in this system was simple and an

efficiency in its practical use was low. The ship mounting that such device was proposed, but a complete collection and separation of all the trash was difficult. Also the trash is flowed into an oil drawing device so that a life of the oil drawing device becomes short.

DISCLOSURE OF THE INVENTION

It is, therefore, an object of the invention to provide a ship for removing floated matter which can be moved rapidly to an accident area (that is, pollution area), separate a trash from the water flowed therethrough and collect it and separate an oil from the water and collect the separated oil.

A ship for removing floated matters according to the present invention comprises a floated matter inflow unit being installed at front end of ship for receiving the floated matters(e.g., oil and trash)floated on the sea; a floated matter guiding passage formed by buoyancy means located at both sides of the ship and a first tank formed at a lower portion of the ship. The floated matter guiding passage guides the floated matters flowed through the floated matter inflow unit.

The ship of the present invention further comprises a trash removing device for removing the trash contained in the floater matter, the trash removing device comprises a plate installed at constant depth in the first tank having a plurality of holes for dispersing the water to the lower portion of the ship, a filtering net installed upward on the plate for blocking the

trash of the floated matter, and a lift means for lifting said trash blocked by the filtering net.

The present invention further comprises an oil separating unit for separating and collecting oil floated on the water along said floated matter guiding passage, the oil separating unit being located at rear portion of the floated matter guiding passage. Also, present invention comprises water discharging means installed at both sides of the ship stern and separated from an oil tank and said oil separating means, respectively, the water discharging means receives water dispersed through the first tank and discharges it outside the ship.

The oil separating means used in the present invention comprises a rotor assembly for separating oil from the water and each of the water discharging means has rotor assembly for discharging the water. A horizontal plate is installed in a constant depth of the first tank, and the plate can disperse uniformly and supplying the water to said water discharging means.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects and features of the instant invention will become apparent from the following description of preferred embodiments taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a top view showing one example of conventional oil skimmer ships;

FIG. 2 is a side view of a conventional oil skimmer ship;

FIG. 3 is a rear view of a conventional oil skimmer ship;

FIG. 4 is an enlarged sectional view providing one example of an oil separation extraction unit for a conventional oil skimmer ship;

FIG. 5 is a perspective view of the ship in accordance with the present invention;

FIG. 6 is a sectional view taken along the line I-I of FIG. 5;

FIG. 7 is a sectional view taken along the line II-II of FIG. 5;

FIG. 8 is a sectional view taken along the line III-III of FIG. 5; and

FIG. 9 is a sectional view taken along the line IV-IV of FIG. 5.

BEST MODE FOR CARRYING OUT THE INVENTION

The present invention will be described in detail referring to the accompanying drawings.

FIG. 5 is a perspective view of the ship according to the present invention, FIG. 6 is a sectional view taken along the line I-I of FIG. 5, and FIG. 7 is a sectional view taken along the line II-II of FIG. 5. At a bow of the ship, a floated matter inflow unit **100** is installed. A floated matter guiding passage **200** is installed at rear part of the floated matter inflow unit **100**. The floated matter guiding passage **200** is extended to

longitudinal direction of the ship.

At rear end of the floated matter guiding passage **200**, an oil separating unit **300** is located. At rear end adjacent to the oil separating unit **300**, an oil storage tank **400** is disposed. A filtering net **610** is fixed upward at a position adjacent to the floated matter guiding passage **200** to separate the trash from the floated matter. A lift means **620** for lifting the trash is installed at a position neighboring to the filtering net **610**.

The floated matter inflow unit **100** has a front wall **111** which can be moved upward or downward by means of a hinge means **110** mounted at low portion of the bow. When the front wall **111** is moved downward as shown in FIG. 5, sea water flow into the floated matter guiding passage **200** through the floated matter inflow unit **100**

The floated matter guiding passage **200** is connected to the floated matter inflow unit **100**, and two buoyancy means **210** for supplying a buoyancy to the ship are located at the both side the floated matter guiding passage **200**, respectively. The buoyancy means **210** are formed at upper portions of the right and left sides with walls **212** having a regular interval. A tapered guiding wall **211** is formed at front portion of the each buoyancy menas **210** to guide the floated matter into the floated matter guiding passage **200**.

The floated matter guiding passage **200** is a space which are formed by the two buoyancy menas **210**, bottom of the each buoyancy menas **210**(that is, a bottom of housing in which the

buoyancy menas **210** is received) is inclined toward bottom of the ship, therefore, a first collecting tank **240** is formed at a central space. In the first collecting tank **240**, a plate **241** having a plurality of holes **242** is installed at certain depth thereof for dispersing the seawater to the bottom portion. At the rear end of the buoyancy means **210**, the floated matter guiding passage **200** is inclined towards both sides of the ship by a first bulkhead **230** as shown in FIG. 7.

Although, a pair of the first bulkheads **230** are shown in FIG. 7, only one of the first bulkheads will be described. The first bulkhead **230** is integrated with a second bulkhead **232** forming an oil storage tank **400** and a third bulkhead **233** extended toward the second bulkhead **232** and a side of the ship. That is, a rotor assembly **311** of the oil separating unit **300** and rotor assemblies **511** of a water discharging unit **500** are not in contacted with the water by the second and third bulkhead **232** and **233**.

As shown in FIGs. 6 and 7, a lower part of the third bulkhead **233** is connected to a water flow passage **231** for flowing the water filled in the first collecting tank **240** to the water discharging unit **500**. Therefore, the water flowed and collected the first collecting tank **240** through the floated matter guiding passage **200** is moved to the rotor assemblies **511** of the water discharging units **500**.

The floated matter guiding passage **200** and the oil collecting tank **400** located at a rear portion of the ship are

divided by the second bulkhead **232** acting as a wall of the oil collecting tank **400** and the third bulkhead **233** extended to a width direction. Height of the second bulkhead **232** adjacent to the rotor assembly **311** is higher than a level of water so that the rotor assembly **311** can separate an oil floated on the water. As a desirable example of the rotor assemblies **311**, **511**, it may be presented the construction for receiving a driving force of motors **M1**, **M2**. Also, the rotor assembly **511** of the water discharging unit **500** can be replaced by a pump for discharging a water which is a function of the rotor assembly. The each rotor assembly **511** is constructed at rear portion of the buoyancy body **210** so as to discharge the water flowed through the floated matter guiding passage **200** and the water flow passage **231** of the third bulkhead **233**. A wall **212** on which the rotor assembly **311** of the oil separating unit **300** is mounted has a rounded surface **312** for guiding the sea water to the rotor assembly **311**. It is more desirable to form a buoyancy means or a buoyancy space under the rounded surface **312**.

A low member **512** located under the rotor assembly **511** and connected to water flow passage 231 has a rounded shape. The second bulkhead **232** acting as a tank walls forms the oil collecting tank **400** at rear portion of the ship. If necessary, an engine room can be provided with the oil collecting tank **400**. Also, a discharging pipe **410** connecting a lower portion of the oil collecting tank **400** and the rotor assembly **511** of the water discharging unit **500** can be provided for discharging the water

contained with the oil collecting tank **400** to the rotor assembly **511**. Probably, an outlet of the discharging pipe **410** is located at higher position than the seawater level so that the seawater cannot be flowed in the discharging pipe **410**, but be only discharged. In FIG. 6, space except the third bulkhead **233**, the rounded surface **512** and the water flow passage **231** can be utilized as a buoyancy mean or a buoyancy space. A space formed under the rounded surface **312** shown in FIG. 7 is sealed to form the auxiliary buoyancy space **313**.

FIG. 8 is a sectional view taken along the line III-III of FIG. 5, and FIG. 9 is a sectional view taken along the line IV-IV of FIG. 5. A buoyancy space **130** is formed at lower portion of a bow of the ship, and a top face of the buoyancy space **130** becomes a bottom face **131** of the bow of the ship. The front wall **111** is mounted movably at the bottom face **131** by a hinge **110**. For convenience, a means for operating the front wall **111** is not shown in the drawing. When the front wall **111** is moved downward as shown in FIG. 5, the water is flowed into the floated matter guiding passage **200** along with the floated matter and oil covering the water.

In this state, the floated matter comprising the oil is floated on the water by the buoyancy, wherein the floated matter comprises a floated oil and/or floated trash. The floated matter and water are received into the first collecting tank **240** connected to the floated matter guiding part **200**. The buoyancy means **210** is located at the upper portion of the first collecting

tank **240** to provide the buoyancy to the ship.

The horizontal plate **241** having a plurality of holes **242** is positioned in the first collecting tank **240**. On the plate **241**, the filtering net **610** for blocking and separating an inflow of trash in the floated matter is fixed in a perpendicular direction. It also is possible to change a direction of the filtering net **610** in a perpendicular direction or a slanted direction etc., if necessary.

The lift means **600** for lifting the trash blocked by the filtering net **610** is mounted on the filtering net **610**. The oil separating unit **300** comprising the rotor assembly **311**, the rounded surface **312** and the motor **M1** shown in FIG. 5, and the first collecting tank **240** are formed by the second bulkhead **232** which block an upper portion(that is, oil floated on the water) of the water and separate the oil storage tank **400**. The water flow passage **231** for guiding the water to the rotor assembly **511** is formed on the third bulkhead **233** separating the both rotor assemblies **511** from the first collecting tank **240**. Character **M2** indicates a motor used for driving of the both rotor assemblies **511**.

The water discharging unit **500** comprising the rotor assembly **511** and the rounded surface **512** is constructed so as to constantly supply the water received in the frist collecting tank **240** through the holes **242** of the plate **241**. A lower end (inlet) of the water flow passage **231** formed by the third bulkhead **233** is oriented to the lower portion of the first

collecting tank **240** to supply the water to the water discharging unit **500** which can discharge the water.

In the present invention with such construction, when water filled within the buoyancy spaces **130**, **313** shown in FIG. 8 or FIG. 9 is discharged at the time of closing the front of the floated inflow unit **100** as shown in a dotted line of FIG. 5, the buoyancy of the ship rises and the bow of the ship or the ship itself floats. Preferably, if the water filled in the first collecting tank **240** is discharged by a pump(not shown in the drawings), an additional space together with the buoyancy spaces **130**, **313** is provided; therefore, the buoyancy is increased relatively. For example, if the ship floats as much as **S2-S1** (**S2**:position in working, **S1**: position in moving) of FIG. 6, a resistance caused by the water becomes relatively small so that the ship can move rapidly to an accident area. Although the buoyancy spaces **130**, **313** are provided only in the bow and the stern of the ship as shown in the drawing, is desirable to add or change a construction and a number of the buoyancy space, if necessary,

When the ship arrives at the accident area, water is again filled within the buoyancy spaces **130**, **313** to sink the ship to position of **S2** shown in FIGs. 8 and 9. In this state, the front wall **111** is moved downward as shown by a real line of FIG. 5. Thus, the floated matter flows in the ship. Hereinafter, the trash and oil are separated from the water and collected. At this time, the front wall **111** rotated around the hinge **110** is moved

downward or upward by a known operating means such as a motor or a cylinder, etc., (not shown in FIG. 5.) In other words, the front wall **111** is opened from the dot line state of FIG. 5 to the real line state.

The floated matter, e.g., oil and trash flowed into the ship along with the water flows in the floated matter guiding part **200** along the guiding wall **211** having a dustpan shape. At this time, the buoyancy means **210** located at both sides of the ship provide a buoyancy as shown in FIG. 7. The oil separating unit **300** in the present invention has the rotor assembly **311** installed at the center thereof. The both rotor assemblies **511** of the water discharging unit **500** receive the water flowed-in through the water flow passage **231** of the third bulkhead **233** from a lower portion of the first collecting tank **240** shown in FIGs. 6 and 7 and then discharge water via the rounded surface **512** shown in FIG. 6. These both rotor assemblies **511** may be replaced by a water discharging pump having a hydraulic function if necessary. Since the water is heavier than oil and the lower end (inlet portion) of the water flow passage **231** is positioned at the bottom portion of the ship, only the water is supplied to the water discharging unit **500** through the water flow passage **231**.

At this time, the plate **241** having a plurality of the holes **242** is mounted in a certain depth of the first tank **240**, thus a water level is not increased and maintained at a constant level, and the water is guided to the bottom face of the ship under a uniform pressure. The holes **242** of the plate **241** prevent

a movement of an alien substance or a weighed body, so as to prevent a collision with the water discharging units **500**. The water discharging units **500** receive the water through the bottom portion of the first collecting tank **240**, and then the water discharging units **500** discharge the water from the lower part to the outside of the ship. Therefore, a thickness of the oil layer is increased in the first collecting tank **240**. That is, the water is bailed by the both water discharging units **500**, but the oil is bailed by the only one rotor assembly **311** of the oil separating unit **300** formed at a central position by the second bulkhead **232** and the spacial wall **212**. Therefore, a thickness of the oil collected on the upper portion of the first collecting tank **240** is gradually increased, and the oil is easily moved into the oil collecting tank **400** by the rotor assembly **311** of the oil separating unit **300**.

Since the first collecting tank **240** is directly connected to the floated matter guiding passage **200** and the water is supplied to the both water discharging units **500** isolated from the floated matter guiding passage **200** by the third bulkhead **233** by the water guiding passage **231**, the water is discharged by both water discharging units **500** and the oil is separated from the water and moved into oil storage tank **400**. The oil separating unit **300** separates and removes the oil floated on the water on which the trash has already removed.

That is, the oil floated on the water is guided into the floated matter guiding passage **200** having a narrow width

relative to a width of the ship, the water which is discharged through the water discharging units **500**. Accordingly, the thickness of the oil becomes relatively thick, the rotor assembly **311** of the oil separating unit **300** is operated to separate the oil from the water and move the separated oil to the oil storage tank **400** like that oil is bailed by a rice scoop, without a change of potential energy of the oil. Thus a consumption of energy caused by a change of the energy is reduced so as to easily remove the oil.

In the oil storage tank **400**, the water is located under the oil layer since a specific gravity of the oil is less than that of the water and the upper end of the second bulkhead **232** forming the tank wall of the oil storage tank **400** is located higher than the water level. Consequently, a hydraulic pressure in the oil storage tank **400** is higher than that of the first collecting tank **240**; therefore, the water flowed at the lower portion of the oil storage tank **400** is flowed to the water discharging units **500** through the discharging pipe **410** having an outlet end corresponding to the lower end of the oil storage tank **400**. Such operation is repeated and a consistency of the oil in the oil storage tank **400** is increased.

Although the above description has been described for removing the floated matter floated on the sea water, the present invention can be used on fresh water such as lake and river.

In the present invention as described above, each of three principal spaces formed by the bulkheads has an opening, and the

both water discharging units and the first collecting tank are interconnected by the water guiding passage. Therefore, the water is discharged by the both water discharging units and oil is separated from the water by one oil separating unit formed on the floated matter guiding passage. That is, since a quantity of the discharged water is greater than that of the oil separated from the water by one oil separating unit, an oil layer becomes relatively thick, which makes the oil separating unit to easily separate the oil without a change of potential energy for the oil.

Further, the oil storage tank in which the separated oil is received has a discharging pipe, so that the water received within the oil storage tank can be discharged; thus, only the oil can be received in the oil storage tank. The buoyancy units are provided in the ship of the present invention, the ship can be moved toward an accident area rapidly.

An efficiency in the movement of the ship and its work is improved since a front wall forming a floated matter guiding passage is rotated for working or a movement. In addition, buoyancy means are provided at both sides of the ship in one body so that it is possible to prevent a capsize of the ship and to collect the oil even in nasty weather. The horizontal plate having a plurality of holes is installed at a certain depth in the first collecting tank forming the floated matter guiding passage, the water is moved uniformly to the lower portion of the ship so that the water with a uniform pressure is supplied to the

water discharging units. Also, since the plate having a plurality of holes blocks the movement of alien substances, the durability of the water discharging can be enhanced.

Although the invention has been shown and described with respect to the preferred embodiments, it will be understood that various changes and modifications may be made by those skilled in the art without departing from the spirit and scope of the invention as defined in the following claims.

WHAT IS CLAIMED IS :

1. A ship for removing floated matters comprising a floated matter inflow unit for receiving the floated matters(e.g., oil and trash)floated on the sea; a trash removing means for separating and collecting the trash from the floated matter flowed through said floated matter inflow unit; and an oil separating unit for separating and collecting oil floated on the water, wherein said ship comprising:

a floated matter guiding passage formed by buoyancy means located at both sides of the ship and a first tank formed at a lower portion of the ship, said floated matter guiding passage guiding the floated matters flowing through said the floated matter inflow unit;

a trash removing device for removing the trash contained in the floater matter, said trash removing comprising a plate installed at constant depth in said first tank having a plurality of holes for dispersing the water to the lower portion of the ship, a filtering net installed upward on said plate for blocking the trash of the floated matter flowing along said floated matter guiding passage, and a lift means for lifting said trash blocked by the filtering net; and

water discharging means installed at both sides of the ship stern and separated from an oil tank and said oil separating means, respectively, said water discharging means receiving water dispersed through said first tank and discharges it

outside the ship.

2. The ship of claim 1, said oil separating means comprises a rotor assembly for separating oil from the water and each of said water discharging means has rotor assembly for discharging the water

3. The ship of claim 1, wherein said first tank comprises a plate horizontally installed in a constant depth thereof, said plate dispersing uniformly and supplying the water to said water discharging means.

4. The ship of claim 1, wherein said water discharging means receives the water from said first tank through a water guiding passage having an inlet end located at lower portion of said the first tank.

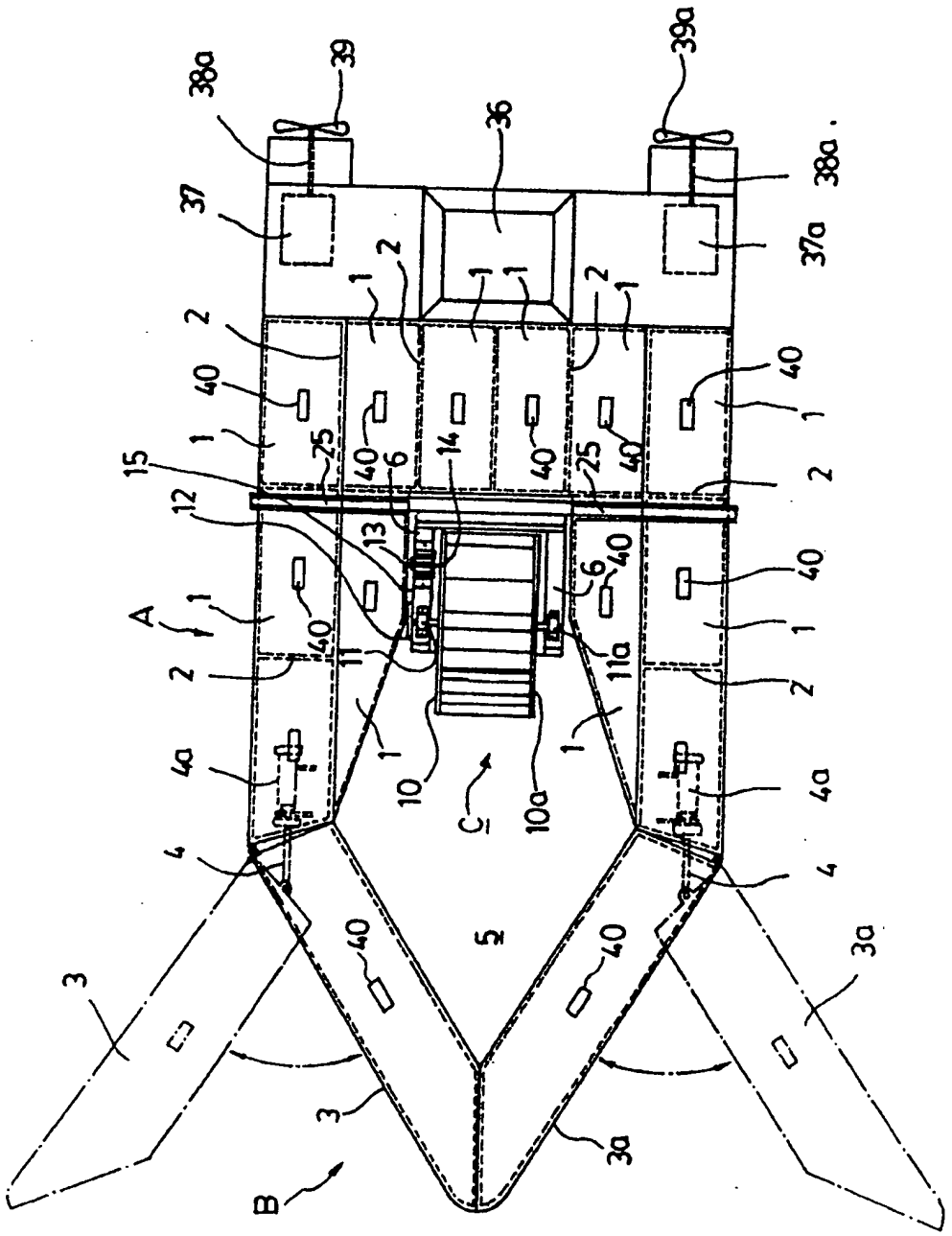


Fig.1

Fig.2

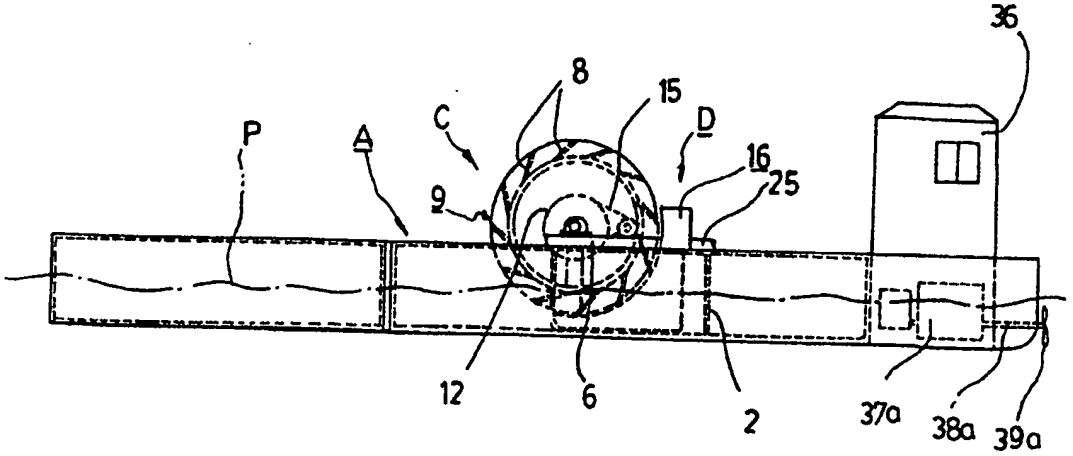
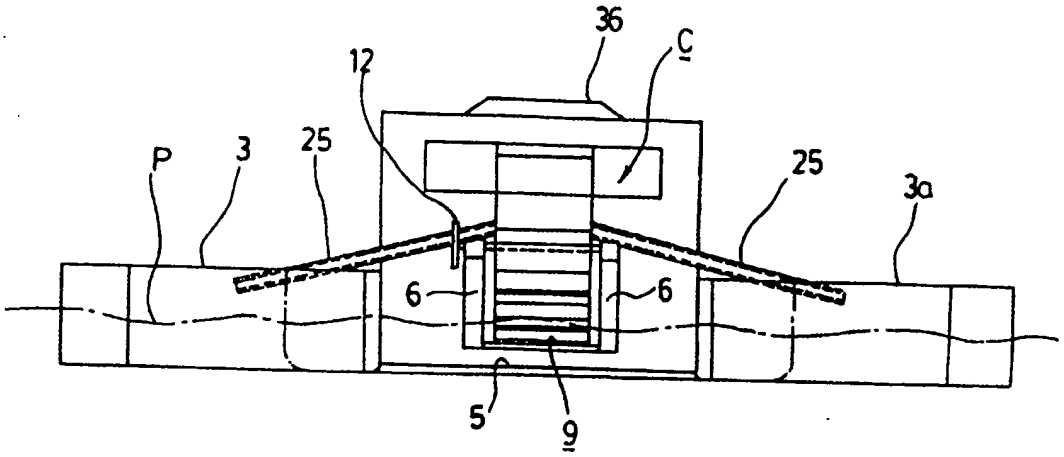


Fig.3



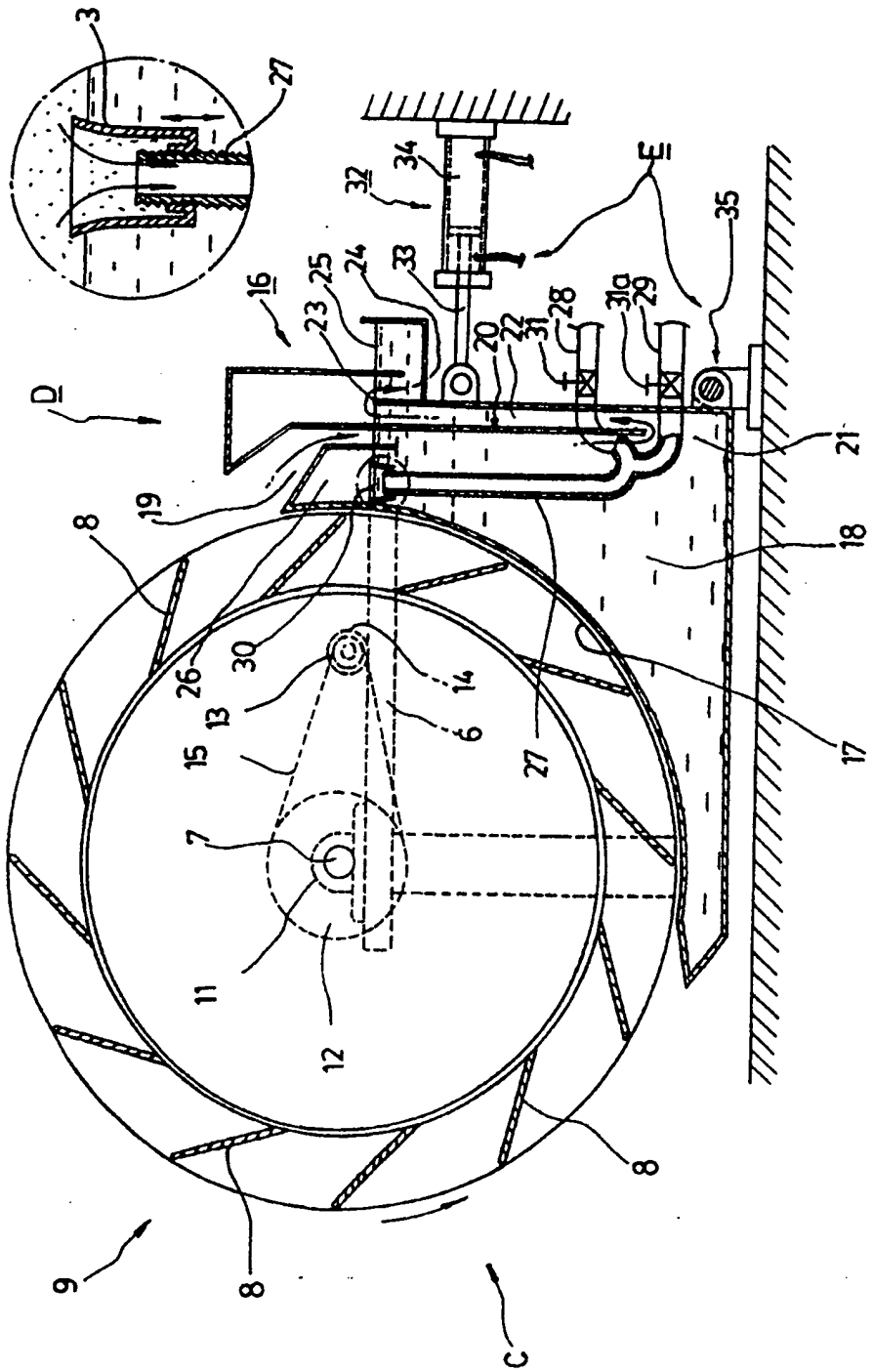


Fig.4

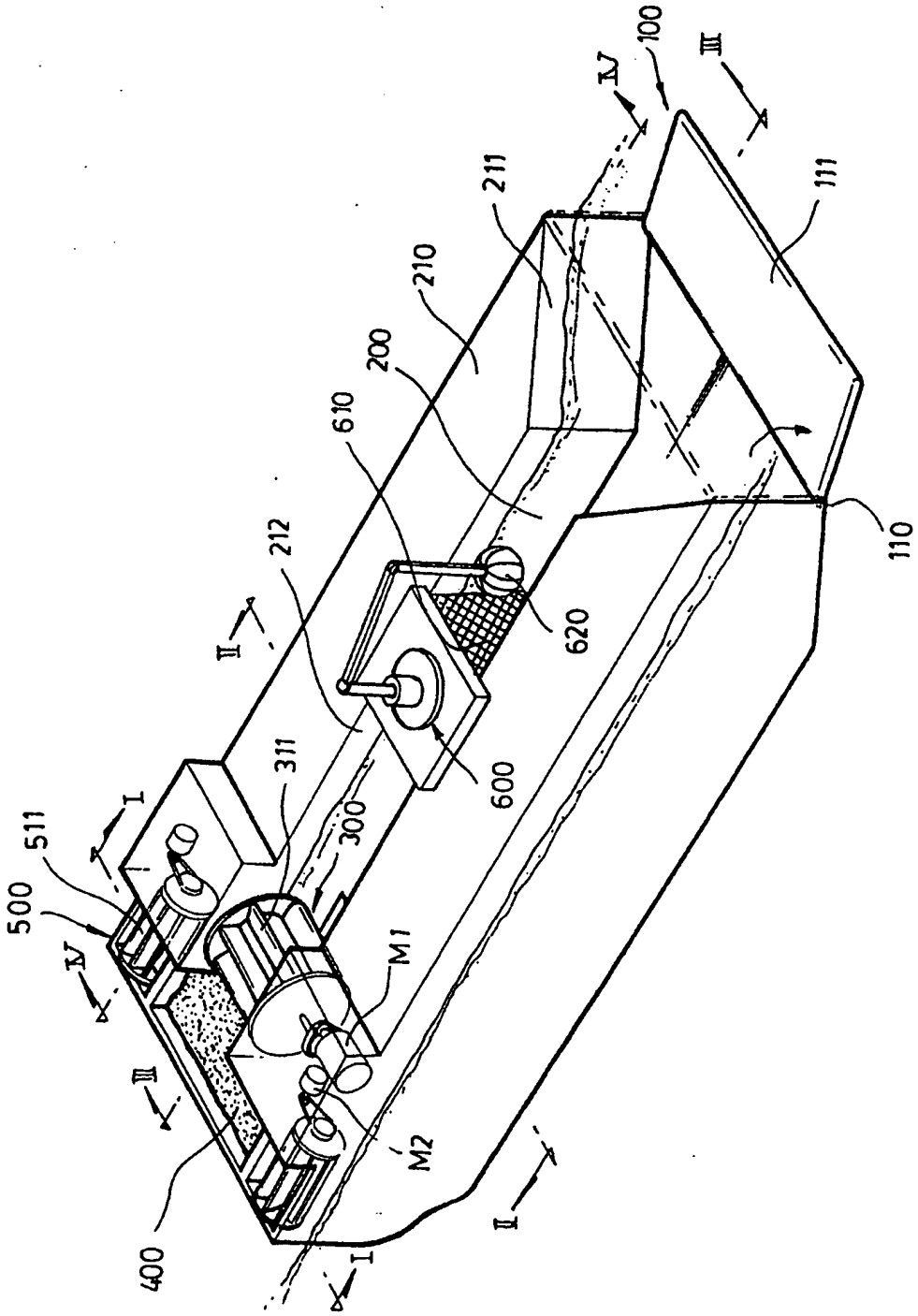


Fig.5

Fig.6

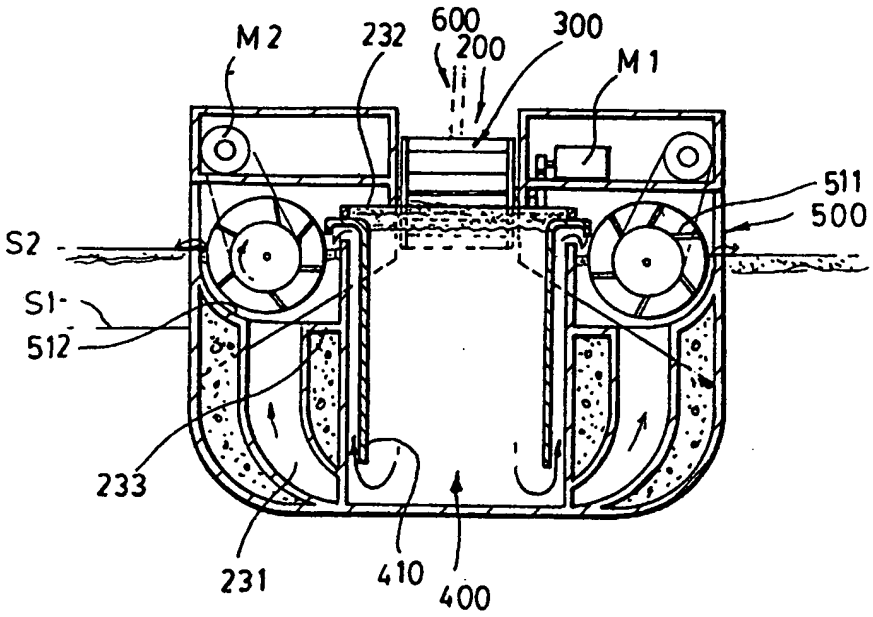
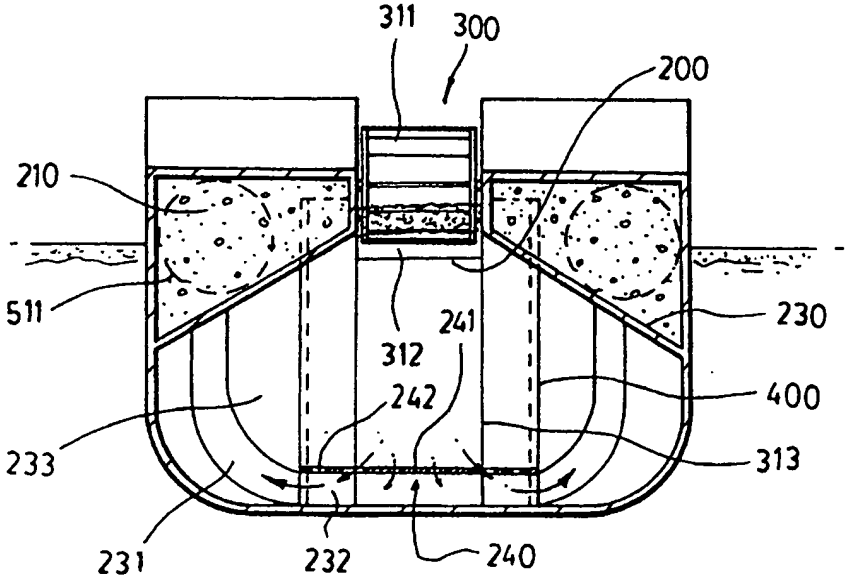


Fig.7



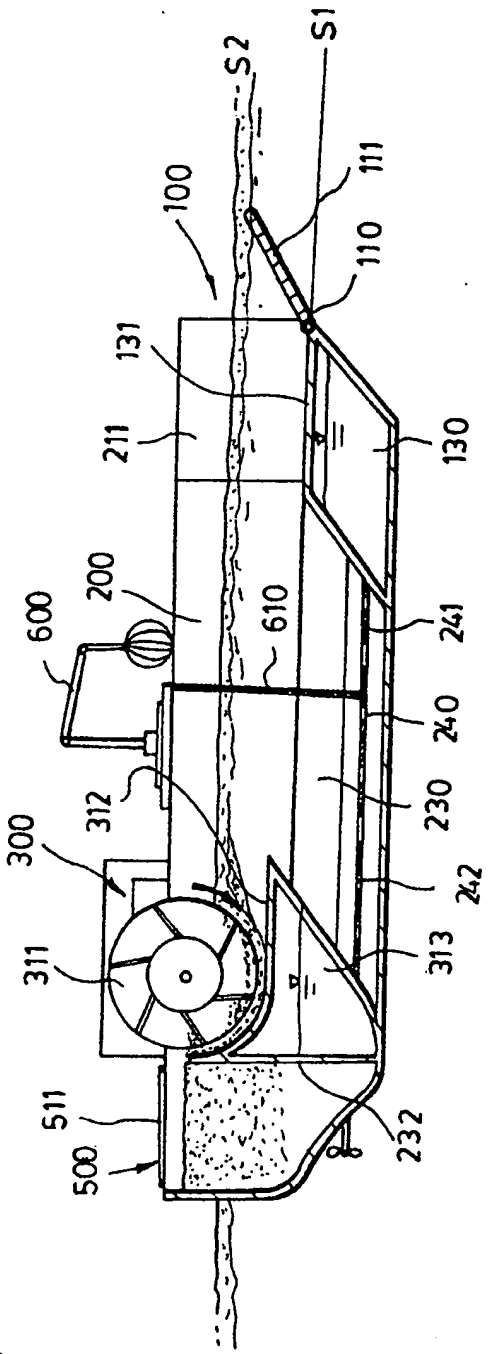


Fig.8

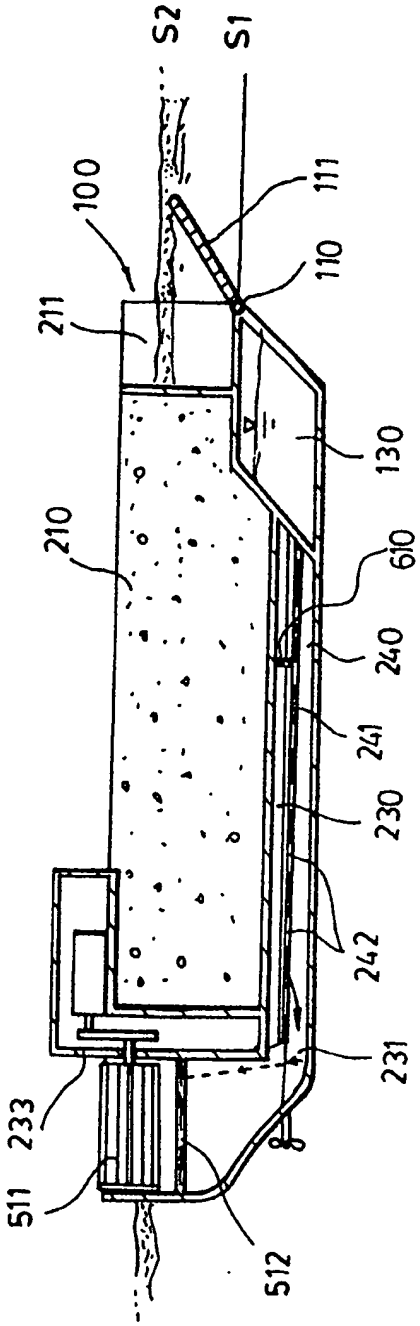


Fig.9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 99/00673

A. CLASSIFICATION OF SUBJECT MATTER

IPC[7]: B 63 B 35/32; E 02 B 15/04

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC[7]: B 63 B; E 02 B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPODOC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 2433009 B2 (BRIDGESTONE TIRE CO. LTD.) 18 August 1977 (18.08.77) totality.	1
A	GB 1425726 A (BRIDGESTONE TIRE KABUSHIKI KAISHA) 18 February 1976 (18.02.76) totality.	1
A	DE 2551377 A1 (BODAN-WERFT MOTOREN UND SCHIFFBAU GMBH) 26 May 1977 (26.05.77) totality.	1,2
A	GB 1533814 A (MITSUBISHI JUKOGYO KABUSHIKI KAISHA) 29 November 1978 (29.11.78).	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
„A" document defining the general state of the art which is not considered to be of particular relevance
„E" earlier application or patent but published on or after the international filing date
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„O" document referring to an oral disclosure, use, exhibition or other means
„P" document published prior to the international filing date but later than the priority date claimed
„T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
„X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
„Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
„&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 January 2000 (26.01.00)	28 February 2000 (28.02.00)

Name and mailing adress of the ISA/AT	Authorized officer
Austrian Patent Office Kohlmarkt 8-10; A-1014 Vienna Facsimile No. 1/53424/200	Schmickl Telephone No. 1/53424/420

Form PCT/ISA/210 (second sheet) (July 1998)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KR 99/00673

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